Claims

1. Directional coupler (1) in coplanar waveguide technology comprising at least one first directional coupler unit (100) with a first connection (103) for feeding in or guiding out a wave, a second connection (104) for feeding in or guiding out a wave supplied directly from or to the first connection (103), a coupled connection (106) for coupling a fraction of a feeded wave at connection (103), a termination (105), a first center conductor (107) connecting the first connection (103) and the second connection (104), a second center conductor (108 connecting the coupled connection (106) and the termination (105), and ground conductors (110, 112) bordering the outside of each of the center conductors,
characterised in that
the spacing between the two center conductors (107,108) changes along the longitudinal extension of the center conductors (107, 108) over a coupler section (102).

2. Directional coupler in coplanar waveguide technology according to claim 1,
characterised in that
the spacing between the center conductors (107,108) increases exponentially in the direction from the first connection (103) and/or from the coupled connection (106) towards the second connection (104) and/or towards the termination (105).

3. Directional coupler (1) in coplanar wave guide technology comprising at least one first directional coupler unit (100) with a first

connection (103) for feeding in or guiding out a wave, a second connection (104) for feeding in or guiding out a wave supplied directly from or to the first connection (103), a coupled connection (106) for coupling a fraction of a feeded wave at connection (103), a termination (105), a first center conductor (107) connecting the first connection (103) and the second connection (104), a second center conductor (108) connecting the coupled connection (106) and the termination (105) and ground conductors (110, 112) bordering the outside of each of the center conductors (107, 108),

characterised in that

the spacing in each case between a center conductor (107; 108) and an adjacent ground conductor (110; 112) changes along the longitudinal extension of the center conductor (107; 108) over a coupler section (102).

4. Directional coupler in coplanar waveguide technology according to claim 3,

characterised in that

the spacing in each case between a center conductor (107; 108) and an adjacent ground conductor (110; 112) increases or decreases in a linear manner between two adjacent coupler segments originally of constant width.

5. Directional coupler in coplanar waveguide technology according to claim 4,

characterised in that

the spacing in each case between a center conductor (107; 108) and an adjacent ground conductor (110; 112) lies above a predetermined lower limit value g_{MIN} and below a predetermined upper limit value g_{MAX}.

6. Directional coupler according to any one of claims 3 to 5,
characterised in that
the spacing between the two center conductors (107, 108) changes along the longitudinal extension of the center conductor (107,108) over the coupler section (102).

7. Directional coupler (1) in coplanar waveguide technology comprising at least one first directional coupler unit (100) with a first connection (103) for feeding in or guiding out a wave, a second connection (104) for feeding in or guiding out a wave supplied directly from or to the first connection (103), a coupled connection (106) for coupling a fraction of a feeded wave at connection (103), a termination (105), a first center conductor (107) connecting the first connection (103) and the second connection (104), a second center conductor (108) connecting the coupled connection (106) and the termination (105) and ground conductors (110, 112) bordering the outside of each of the center conductors (107, 108),
characterised in that
the width of the conductor track of the two center conductors (107,108) changes along the longitudinal extension of the center conductors (107,108) over a coupler section (102).

8. Directional coupler in coplanar waveguide technology according to claim 7,
characterised in that
the width of the conductor track of the center conductors (107,108) increases continuously in the

direction from the first connection (103) and/or from the coupled connection (106) towards the second connection (104) and/or the termination (105).

9. Directional coupler in coplanar waveguide technology according to claim 7 or 8, **characterised in that** the spacing between the two center conductors (107; 108) changes along the longitudinal extension of the center conductors (107; 108) over the coupler section (102).

10. Directional coupler in coplanar waveguide technology according to any one of claims 7 to 9, **characterised in that** the spacing in each case between a center conductor (107; 108) and an adjacent ground conductor (110;112) changes along the longitudinal axis of the center conductors (107; 108) over the coupler section (102).

11. Directional coupler in coplanar waveguide technology according to any one of claims 1 to 10, **characterised in that** the termination (105) is terminated with a trapezoidal absorber (127).

12. Directional coupler in coplanar waveguide technology according to any one of claims 1 to 11, **characterised in that** the second connection (104) of the first directional coupler unit (100) is connected via a center conductor (123) with two adjacent ground conductors (110, 112) to a second connection (204) of a second directional coupler unit (200).

13. Directional coupler in coplanar waveguide technology according to claim 12, **characterised in that** the first and the second directional coupler unit (100, 200) are integrated monolithically in mirror image arrangement on a common substrate (101).

14. Directional coupler in coplanar waveguide technology according to any one of claims 1 to 13, **characterised in that,** in the region of the narrowest spacing between the ground conductors (110,112,120(220)), the ground conductors (110,112,120(220)) are connected via air bridges (235), and/or in regions of wider spacing between the ground conductors (110,112,120(220)), the ground conductors (110,112,120(220)) are connected via bonding wires (240).

15. Directional coupler in coplanar waveguide technology according to any one of claims 1 to 14, **characterised in that** the air bridges (235) consist of metallic layers (236) which are separated in an isolating manner by a thin layer of air from the center conductors (207, 208, 218, 221).

16. Directional coupler in coplanar waveguide technology according to any one of claims 1 to 15, **characterised in that** tapers (115,117) are provided at the transitions between coaxial feed lines and the center conductors (107,108), which continuously adapt the cross-sectional geometry of the coaxial feed lines to the cross-sectional geometry of the center conductors (107,108) in order to minimise loss and

reflection.